REMARKS

Claims 1-5, 7-14 and 41-43 are pending herein.

1. Claims 1-10 were rejected under §102(b) over Yamada et al ('921). This rejection is respectfully traversed for the following reasons.

The claimed invention (claim 1) is drawn to a ceramic article comprising a substrate consisting essentially of alumina and a corrosion-resistant coating provided on the substrate. The corrosion-resistant coating according to claim 1 consists essentially of a rare earth oxide and is provided to directly contact the substrate such that the ceramic article is free of any intervening layers between the substrate and the corrosion-resistant coating. In addition, the corrosion-resistant coating is strongly adhered to the substrate, having an adhesion strength not less than about 20 MPa. With respect to the above-noted feature of the direct contact between the substrate and the corrosion-resistant coating, attention is drawn to paragraph 26 of the present specification, specifically addressing prior art structures in which either a graded alumina/rare earth oxide interlayer is utilized, or alternatively, a thermally reacted interlayer formed by deposition of a corrosion-resistant coating followed by thermal treatment to form a reaction product. According to claim 1, such an interlayer, whether graded or thermally reacted, is clearly precluded.

Turning to the teachings of Yamada et al. ('921), the PTO recognizes that Yamada et al. ('921) teach the formation of a reaction product in accordance with the state of the art noted above in the present specification. However, while unclear in the Office Action, the PTO reasons that despite the presence of a reaction product, no intervening layers are formed between the corrosion-resistant coating and the substrate. However, this position is clearly not supported by Yamada et al. ('921), which teaches incorporation of an intervening layer that is formed as a reaction product between the substrate and the corrosion-resistant coating.

In any event, Table 1-4 of Yamada et al. ('921) clearly summarizes the teachings of this reference, in which low temperature heat treatment results in no reaction layer, but notably poor adhesion strength. Yamada et al. ('921) fail to teach or even remotely suggest a structure in which no reaction layer is present having an adhesion strength of not less than about 20 MPa. Stated alternatively, Yamada et al. ('921) require an intervening reaction layer in order to produce high adhesion strength.

For at least the foregoing reasons in view of the amendments to claim 1, reconsideration and withdrawal of the §102 rejection over Yamada et al. are respectfully requested.

2. Claims 1-9 were rejected under §102(e) over O'Donnell et al. This rejection is respectfully traversed for the following reasons.

As the PTO correctly points out, O'Donnell et al. teach a zirconia coating formed on a substrate. However, as noted above, the claimed invention is specifically drawn to a substrate consisting essentially of alumina, having an overlying corrosion-resistant coating consisting essentially of a rare earth oxide. Zirconia is not a rare earth oxide. In this respect, a rare earth oxide is defined as an oxide of a lanthanide series element, yttrium, or scandium. See, paragraph 23 of the present application. Accordingly, the PTO's reliance upon O'Donnell et al. is entirely deficient.

For at least the foregoing reasons, withdrawal the §102(e) rejection is respectfully requested.

3. Claims 1, 6-9, 11, 13 and 14 were rejected under §102(e) over Kato et al. This rejection is respectfully traversed for the following reasons.

In a manner similar to the deficiencies of O'Donnell et al. noted above, Kato et al. fail to disclose or even remotely suggest a ceramic article comprised of a combination of a substrate consisting essentially of alumina and a corrosion-resistant coating overlying the substrate and consisting essentially of a rare earth oxide. In this respect, Kato et al. fail to disclose or even remotely suggest an oxide coating, let alone a rare earth oxide. The disclosure of Kato et al. is limited to hard, non-oxide abrasion resistant coatings in the form of carbides, nitrides, or borides. See the paragraph bridging columns 4 and 5 of Kato et al. Accordingly, the disclosure of Kato et al. is deficient and fails to disclose or even suggest all features of the claimed invention.

For at least the foregoing reasons, reconsideration and withdrawal of the §102(e) rejection over Kato et al. are respectfully requested.

4. Claims 1-9, 11, 13 and 14 were rejected under §102(e) over Yamada et al. ('392). This rejection is respectfully traversed for the following reasons.

Yamada et al. ('392) teach the formation of a yttria-alumina complex oxide overlying a substrate. The yttria-alumina oxide layer has a yttria/alumina ratio within a range of 0.2 to 1.0 (i.e., 17% to 50% yttria). [Paragraph 26]. Yamada et al. ('392) nowhere disclose or even remotely suggest a corrosion-resistant coating consisting essentially of a rare earth oxide. In this respect, the entire disclosure of Yamada et al. ('392) is limited to teaching of a combined (complex) yttria-alumina oxide in an attempt to improve peel strength. As noted above with respect to the rejection over Yamada et al. ('921), the claimed invention was developed to overcome reliance upon graded structures combining alumina and rare earth oxide.

For at least the foregoing reasons, Applicants respectfully submit that the claimed invention is not anticipated by Yamada et al. ('392). Accordingly, withdrawal of the §102 rejection over Yamada et al. ('392) is respectfully requested.

5. Claims 11-14 were rejected under §103 over Yamada et al. ('921). The PTO relies upon Yamada et al. ('921) as described above, but has further reasoned that the maximum average grain size of 0.5 microns contained in claims 11 and 13 of the present specification is an obvious variant of the described 2.0 micron size of Yamada et al. ('921). However, Applicants submit that not only do Yamada et al. ('921) fail to disclose or even remotely suggest modification of the described structure to have a fine grain size, but Yamada et al. ('921) cannot achieve such a fine grain size. In particular, the claimed maximum average grain size associated with the corrosion-resistant coating according to the claimed invention is achieved through a thermal spraying process without subsequent heat treatment. In this respect, subsequent thermal treatment results in grain growth, resulting in an average grain size beyond the 2.0 micron size recited by Yamada et al. ('921). Accordingly, not only does the prior art fail to suggest to one of ordinary skill in the art any modification to achieve fine grain size in the corrosion-resistant coating, but also fails to even remotely *enable* formation of a fine grain size in such coating. Accordingly, withdrawal of the §103 rejection over Yamada et al. is respectfully requested.

6. Claim 12 was rejected under §103 over O'Donnell et al. or Kato et al. These rejections are deficient for the reasons advanced above with respect to claim 1.

7. Claims 11-14 were rejected under §103 over Yamada et al. ('392). Again, the PTO's reliance upon Yamada et al. ('392) is deficient for the reasons advanced above. With further reference to grain size recited in independent claim 13, the attention of the PTO is drawn to paragraph 5 above. To summarize, Yamada et al. ('392) fails not only to suggest modification of the disclosed process to form a fine grain corrosion-resistant layer, but also fails to even remotely *enable* such formation. Accordingly, withdrawal of the §103 rejection is respectfully requested.

Applicants respectfully submit that the present application is now in condition for allowance. Accordingly, the Examiner is requested to issue a Notice of Allowance for all pending claims.

Should the Examiner deem that any further action by the Applicants would be desirable for placing this application in even better condition for issue, the Examiner is requested to contact Applicants' undersigned attorney at the number listed below.

Applicants do not believe that any additional fees are due, but if the Commissioner believes additional fees are due, the Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 50-2469.

Respectfully submitted,

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Date

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